

ABSTRACT

In a reciprocating engine, power strokes of pistons apply torque to a crankshaft causing it to twist proportionally. Datum time moments are established by triggers rotating with, at one end of, the crank shaft and a sensor sensing passing of the triggers. At an opposed end, ring gear teeth trigger a sensor. At no load, zero twist occurs and arrival time moments of the triggers in relation to the datum time moments are predictable. Under load, twisting in the crank shaft causes the arrival time moments to be delayed, the time lag being proportional to the twist, bearing in mind the effect of rotational speed. With information about physical twist-torque characteristics of the crankshaft, torque values are calculated from the measured twist values, and are used in engine management. The invention can be applied to any shaft, for example also a main shaft of a gas turbine engine.